

CLAIMS

Claims 1-129 canceled.

130. (previously presented) An aerial launch system for an aircraft, said system comprising:

a lifting apparatus for carrying said aircraft to an elevated altitude,
a tow line connecting said lifting apparatus to a base structure, and
launching means,

said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode, said base structure comprising a transportable conveyance comprising a water craft capable of creating a relative wind through forward movement sufficient to provide lift to said lifting apparatus.

Claim 131 canceled.

132. (currently amended) The aerial launch system of claim ~~[[129]]~~ 130 in which a winch is provided to facilitate aerial deployment and recovery of said tow line, said winch enabling said lifting apparatus to be maintained at variable altitudes.

133. (previously presented) An aerial launch system for an aircraft, said system comprising:

a lifting apparatus for carrying said aircraft to an elevated altitude,
a tow line connecting said lifting apparatus to a base structure, and
launching means,

said launching means being adapted to carry said aircraft to said elevated altitude and release said aircraft for flight mode, in which a winch is provided to

facilitate aerial deployment and recovery of said tow line, said winch enabling said lifting apparatus to be maintained at variable altitudes and pulleys are provided for varying the point of deployment of said tow line from said base structure.

Claims 134-140 canceled.

141. (previously presented) An aerial recovery system for an aircraft, said system comprising:

a lifting apparatus for carrying said recovery system to an elevated altitude,

a tow line connecting said aerial apparatus to a base structure, and
arrestment means;

said lifting apparatus being aurally deployed from said base structure, said arrestment means being adapted to capture and retain said aircraft from mid-air flight, said tow line enabling said lifting apparatus and said captured aircraft to be pulled back to said base structure in which said lifting apparatus is a lighter-than-air balloon in combination with a lifting device requiring a relative wind to generate lift.

Claims 142-146 canceled.

147. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft. The aerial recovery system of claim 150 in which a sensor [[Is]] being attached to said recovery system near the point of engagement of said aircraft to said recovery system, for guidance in maneuvering said aircraft into engagement with said recovery system.

Claims 148-150 canceled.

151. (currently amended) The aerial recovery system of claim [[150]] 209 where said line is held up by a lifting apparatus.

152. (currently amended) The aerial recovery system of claim [[150]] 209 where said capturing device is a hook.

153. (previously presented) The aerial recovery system of claim 152 where said hook has a line retaining device.

Claims 154-156 canceled.

157. (previously presented) The aerial recovery system of claim [[150]] 261 in which said capturing device is positioned on a forward inboard edge of a wing of said aircraft.

Claims 158-167 canceled.

Claims 168-176 canceled.

177. (previously presented) The recovery system of claim 257 where said arrestment line is held up by a beam, the beam comprising a boom.

Claims 178-183 canceled.

184. (previously presented) An aerial recovery system for an aircraft, said system comprising:

a net, a draw string that passes around the periphery of said net and is slidably attached at points around the periphery of said net, a support system sufficient to carry the weight of the net and the aircraft, said draw string is connected to said support system and said draw string is suitable for pulling the periphery of the net together around the back of said aircraft to encapsulate said aircraft during arrestment.

185. (previously presented) An aerial recovery system for an aircraft, said system comprising: an aerial apparatus for carrying said recovery system to an elevated altitude, a net to capture said aircraft, said net has at least three attach points spaced around the periphery of said net, lines attached to each of said net attach points extend up to support said net and aircraft from said aerial apparatus, the load on said lines during and after arrestment holds the net around said aircraft to help retain said aircraft.

Claims 186-208 canceled.

209. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft. ~~The aerial recovery system of claim 150 in which said structure [[is]]~~

being swept aft five degrees or more to reliably deflect said arrestment line to said capturing device.

210. (currently amended) The aerial recovery system of claim 209 in which said structure is swept aft ~~[[5]]~~ fifteen degrees or more to reliably deflect said arrestment line to said capturing device.

211. (previously presented) The aerial recovery system of claim 209 in which said structure is swept aft 10 degrees or more to reliably deflect said arrestment line to said capturing device.

212. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft. ~~The aerial recovery system of claim 150 in which the a leading edge of said structure sweeps~~ sweeping aft five degrees or more to reliably deflect said arrestment line to said capturing device.

213. (previously presented) The aerial recovery system of claim 212 in which the leading edge of said structure sweeps aft more than ~~[[5]]~~ fifteen degrees to reliably deflect said arrestment line to said capturing device.

214. (previously presented) The aerial recovery system of claim 212 in which the leading edge of said structure sweeps aft more than 10 degrees to reliably deflect said arrestment line to said capturing device.

Claim 215 canceled.

216. (currently amended) The aerial recovery system of claim [[150]] 258 in which the capturing device is located inboard of the aircraft's wingtip.

217. (previously presented) The aerial recovery system of claim 216 in which the capturing device is located inboard more than 5% of the wing semi-span.

Claims 218 and 219 canceled.

220. (previously presented) The aerial recovery system of claim [[150]] 258 in which multiple generally vertically oriented arrestment lines are spaced apart across the direction of travel of said aircraft as it approaches for recovery so as to increase the lateral capture envelope of said recovery system.

221. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft, The aerial recovery system of claim 150 in which said capturing device [[is]] being located generally over the center of gravity of the vehicle when the wings are level so that the aircraft is held in a level attitude after arrestment.

Claims 222-225 canceled.

226. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,
said aircraft containing a device for capturing said line,
said aircraft containing structure suitable for deflecting said line laterally into
engagement with said capturing device, said structure comprising a wing of said
aircraft. ~~The aerial recovery system of claim 150 in which~~ said system ~~[[is]]~~ being
designed to rotate said aircraft to a generally wings level position and hold said
aircraft in said wings level position.

227. (currently amended) The aerial recovery system of claim ~~[[150]]~~
212 in which said line is supported in the air by a rotor.

228. (currently amended) The aerial recovery system of claim ~~[[1]50]]~~
212 in which said line is held up by a boom that can rotate about a generally
vertical axis.

229. (currently amended) An aerial recovery system for an aircraft, said
system comprising:

an arrestment line held up at at least one end,
said aircraft containing a device for capturing said line,
said aircraft containing structure suitable for deflecting said line laterally into
engagement with said capturing device, said structure comprising a wing of said
aircraft. ~~The aerial recovery system of claim 150 in which~~ wherein said line is
supported in the air by another line strung generally horizontally between two
supports.

230. (currently amended) The aerial recovery system of claim ~~[[150]]~~
212 in which said line is supported in the air by an aircraft.

231. (currently amended) A method for capturing a flying object, comprising the steps of:

- a) suspending a linear or curvilinear fixture across the flight path of the object in a generally vertical orientation, or otherwise in an orientation which includes a component normal to the flight path;
- b) guiding the object to strike the fixture;
- c) allowing the subsequent motion of the object to slide the fixture along a wing or spanwise lifting surface of the flying object, the wing or spanwise lifting surface being swept five degrees or more;
- d) intercepting the sliding of the fixture by one or more hooks attached to ~~[[a]]~~ the wing or spanwise lifting surface of the flying object;
- e) decelerating the flying object under the restraint of the fixture; and
- f) removing the flying object from the fixture.

Claims 232-237 canceled.

238. (currently amended) A method for capturing a flying object, comprising the steps of:

- a) suspending a fixture across the flight path of the object in a generally vertical orientation, or otherwise in an orientation which includes a component normal to the flight path, such that the suspension of the fixture is kept clear of said flight path by a distance greater than the height or width of said flying object;
- b) guiding the object to strike said fixture;

c) intercepting the fixture by one or more hooks attached to a wing or spanwise lifting surface of the flying object, the wing or spanwise lifting surface having a sweep of greater than five degrees;

d) decelerating the flying object under the restraint of the fixture; and

e) removing the flying object from the fixture.

Claims 239-244 canceled.

245. (previously presented) The method of claim 238 with the additional step between steps d) and e) of quickly taking out the slack in the fixture.

246. (previously presented) The method of claim 245 in which the slack in the fixture is taken out by a device that pulls on the fixture.

Claim 247 canceled.

248. (currently amended) In combination, a flying object and an apparatus for capturing the flying object, the combination comprising:

a) means for suspending a fixture across the flight path of the object in a generally vertical orientation, or otherwise in an orientation which includes a component normal to the flight path, such that the suspension of the fixture is kept clear of said flight path by a distance greater than the height or width of said flying object;

b) means for suspending the fixture; and

c) means attached to a wing or spanwise lifting surface of the flying object for intercepting the fixture; the combination additionally including a device to rapidly take out the slack in the fixture after engagement of said aircraft to said fixture. ~~The combination of claim 247 where said device~~ [[is]] being located

further down the flight path of said flying object than the suspension point of said fixture.

Claims 249-250 canceled.

251. (previously presented) A method for launching and recovering an unmanned aircraft, said method comprising steps of:

lifting said aircraft to an elevated altitude by means of a lifting apparatus;
connecting said lifting apparatus to a base structure by a tow line,
launching said aircraft at said elevated altitude, and
maneuvering said aircraft into arrestment means while in flight.

Claims 252-256 canceled.

257. (currently amended) The recovery system of claim ~~[[150]]~~ 212 wherein the arrestment line is held up by a device selected from the group consisting of a balloon, an aircraft, a lifting device requiring a relative wind to generate lift, and a beam.

258. (currently amended) An aerial recovery system for an aircraft, said system comprising;

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device. ~~The aerial recovery system of claim 150 wherein said structure is a wing and wherein said wing is swept five degrees or more.~~

259. (previously presented) The recovery system of claim 258 wherein said wing is swept forward.

260. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft. The aerial recovery system of claim 150 in which wherein said structure includes a leading edge swept [[aft]] at least fifteen degrees.

261. (currently amended) An aerial recovery system for an aircraft, said system comprising:

an arrestment line held up at at least one end,

said aircraft containing a device for capturing said line,

said aircraft containing structure suitable for deflecting said line laterally into engagement with said capturing device, said structure comprising a wing of said aircraft. The aerial recovery system of claim 150 wherein said structure includes a leading edge swept forward at least twenty degrees.

262. (currently amended) An aerial recovery system for a heavier-than-air aircraft, said system comprising,

the aircraft; and

an arrestment line held up at at least one end,

said aircraft comprising a capturing device for capturing said line and structure suitable for deflecting said line laterally into engagement with said capturing device. ~~The aerial recovery system of claim 253~~ wherein said capturing device is located generally over the center of gravity of the vehicle when the wings are level so that the aircraft is held in a level attitude after arrestment.

Claims 263-278 canceled.

279. (currently amended) A method for capturing a flying object comprising:

allowing a spanwise lifting surface of a flying object to strike a fixture positioned at an angle relative to the spanwise lifting surface while imparting a decelerating force to the flying object;

releasably engaging the fixture with a capture device on the flying object; and

retrieving the flying object. ~~The method of claim 270~~ wherein the lifting surface of the flying object is selected to be swept five degrees or more.

280. (currently amended) A method for capturing a flying object comprising:

allowing a spanwise lifting surface of a flying object to strike a fixture positioned at an angle relative to the spanwise lifting surface while imparting a decelerating force to the flying object;

releasably engaging the fixture with a capture device on the flying object; and

retrieving the flying object. The method of claim 270 wherein a forward edge of the lifting surface is swept forward or back by at least fifteen degrees.

281. (currently amended) A method for capturing a flying object comprising:

positioning a fixture in a flight path of the flying object such that the fixture is inclined at an angle relative to a spanwise lifting surface of the flying object;

allowing guiding a lateral deflecting structure of the flying object to strike the fixture while imparting a decelerating force to the flying object, the lateral deflecting structure ~~being attached to~~ comprising a wing of the flying object and having at least a 15 degree swept back or 20 degree swept forward angle;

releasably engaging the fixture with a capture device on the flying object; and

retrieving the flying object.

282. (currently amended) The method of claim 281 wherein the lateral deflecting structure is a lead leading edge of the wing.

Claims 283 and 284 canceled.

285. (currently amended) In combination:

an aircraft comprising at least one ~~aft swept wing~~ swept aft at least five degrees, and a capture device mounted on an outboard ~~leading edge~~ portion of the at least one wing, and

a fixture positionable in a flight path of the aircraft such that the fixture is inclined at an angle relative to the at least one wing of the aircraft to permit the fixture to intercept ~~the lead~~ a leading edge of the at least one wing and to guide the fixture into connection with the capture device.

286. (currently amended) A method of recovering an aircraft, the method comprising

providing an aircraft having at least one ~~aft swept wing~~, and a hook mounted on an outboard ~~leading edge~~ portion of the at least one wing,

positioning a line in a flight path of the aircraft such that the line is inclined at an angle relative to the at least one wing of the aircraft, and

causing ~~the lead~~ a leading edge of the at least one wing to intercept the line to guide the line into connection with the hook.

287. (currently amended) The method of claim 286 wherein the ~~lead~~ leading edge of the at least one wing of the aircraft is swept back at least fifteen degrees.

288. (previously presented) The method of claim 286 wherein the line permits extended forward movement of the aircraft and reduces arrestment loads on the aircraft.

289. (currently amended) A flying object comprising a spanwise lifting surface, a lateral deflecting structure ~~attached to~~ comprising the spanwise lifting

surface, the lateral deflecting structure having at least a 15 degree swept back or 20 degree swept forward angle, and a capture device adjacent the lateral deflecting structure, the capture device comprising a hook and a latch.

Claims 290-291 canceled.

292. (new) In combination:

an aircraft comprising at least one wing and a capture device mounted on an outboard portion of the at least one wing, wherein the capture device extends forward of a line along a leading edge of the wing extending more than twenty percent of the length of the leading edge, and

a fixture positionable in a flight path of the aircraft such that the fixture is inclined at an angle relative to the at least one wing of the aircraft to permit the fixture to intercept the leading edge of the at least one wing and to guide the fixture into connection with the capture device, the forward-extending capture device being proportioned to capture the fixture even when the fixture is forward of said line.